REMARKS

Claims 1-3 and 5-7 are pending in the application.

Claim1-3 and 5-7 have been amended in order to more particularly point out, and distinctly claim the subject matter to which the Applicants regard as their invention. It is believed that this Amendment is fully responsive to the Office Action dated **November 7, 2002**.

Objections to the Abstract

The Examiner has objected to the Abstract for including the words "means" and "said". A substitute Abstract is attached herewith obviating the outstanding objection. Therefore, withdrawal of the objection to the abstract is respectfully requested.

Objection to the Specification

The Examiner has also objected to the specification because of informalities. Taking the Examiner's comments into consideration, the specification has been amended. Therefore, withdrawal of the objection to the specification is respectfully requested.

Objection to the Drawings

The Examiner has objected to Figures 4a and 4b as not being labeled as stated in the specification. Taking the Examiner's comments into consideration, request for drawings changes approval is hereby submitted with this Amendment. Therefore, withdrawal of the objection to figures is respectfully requested.

Claim Rejections under 35 USC §112

Claims 3 and 7 are rejected under 35 USC §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Taking the Examiner's comments into consideration, Claims 3 and 7 have been amended. Therefore, withdrawal of the rejection of Claims 3 and 7 under 35 USC § 112, second paragraph, is respectfully requested.

Claim Rejections under 35 USC §102

Claims 1 and 5 are rejected under 35 USC §102(b) as being anticipated by JP Patent No. 1-202241 to Hayata et al.

Hayata et al. describes a system and method of identifying pieces of shell from shucked shellfish utilizing x-ray imaging. X-rays from an x-ray radiator (32) are shown upon shucked shellfish (14) and the light from a fluorescent plate (36) is converted into an electrical signal. The electrical signal is then measured for intensity and absorption of specific wavelengths. Utilizing this irradiation of the shellfish, it is possible to identify pieces of shell attached to the shellfish.

The present invention is a method and device for identifying pieces of shell attached to stripped shellfish. The present invention irradiates shrimp with light of about a peak 254 nm wavelength and clearly illuminates the shell attached to the shellfish. Further, the present

invention illuminates crabs at peak 400 nm wavelength and clearly illuminates any shell attached to the crab flesh. Please refer to page 7, line 14+, for a further discussion of the peak wavelengths involved.

The present invention and Hayata et al. are completely different. In the present invention, it is foreign matter that is the object under investigation and that emits light upon excitation. Whereas, in Hayata et al., it is the x-ray fluorescent plate that emits light upon excitation by x-rays that a pass through the object under investigation.

Specifically, Claims 1 and 5 patentably distinguish over the prior art relied upon, by reciting, as exemplified by claim 1,

> "A method of detecting and removing unstripped residual shell left on shellfish, comprising: irradiating light of specific wave-range onto stripped shellfish after finishing a shell-stripping work on the shellfish, and on the basis of information on the intensity of fluorescent light emitted from the shellfish, determining if there is residual shell on the stripped shellfish and subsequently removing any residual shell, wherein the shellfish is shrimp and crab and when the shellfish is shrimp a peak wavelength of irradiating light is 352 nm or less and when the shellfish is crab a peak wavelength is less than 400 nm. (Emphasis Added)

Therefore, withdrawal of the rejection of Claims 1 and 5 under 35 USC §102(b) as being anticipated by JP Patent No. 1-202241 to Hayata et al. is respectfully requested.

Claim Rejections under 35 USC §103

Claims 2, 3/1, 3/2, 4/1, 4/2, 6, 7/5, 7/6, 8/5 and 8/6 are rejected under 35 USC §103(a) as being unpatentable over Hayata et al. as applied to claims 1 and 5 above and further in view of Tessier et al. (U.S. Patent No. 5,902,177).

Tessier et al. describes a device and method for removing ribs from a pork flank. This device and method entails measuring the thickness of the ribs utilizing reflected light. Through experimentation, it has been discovered that optimum excitation is provided by a wavelength of 335 nm plus or minus 20 nm and maximum contrast is obtained at 410 nm.

The Examiner asserts that the method described by Tessier et al. would work equally as well for Hayata et al. The Examiner's motivation to combine Hayata et al. and Tessier et al. is respectfully traversed, since Hayata et al. deals with shellfish and Tessier et al. deals with pork flanks. Therefore, there is no motivation to combine the teachings of Tessier et al. into Hayata et al. and no reasonable expectation of success. Further, as discussed in MPEP § 2143.01 the mere fact that references can be combined is not sufficient motivation to establish a *prima facie* case of obviousness.

Further, Tessier et al. and the present invention have completely different objects of investigation. In the present invention it is shellfish that emit fluorescence. While in Tessier et al. it is the ribs of vertebrate mammals that emit fluorescence. In the present invention, it is foreign matter that is the object under investigation and that emits light upon excitation. Whereas, in Tessier et al., it is the x-ray fluorescent plate that emits light upon excitation by x-rays that a pass through the object under investigation.

Specifically, independent Claims 2 and 6 patentably distinguish over the prior art relied upon, by reciting, as exemplified by claim 2,

> " A method of detecting and removing unstripped residual shell left on shellfish, comprising: irradiating light of specific wave-range onto stripped shellfish after finishing the shell-stripping work on the shellfish, taking an image of the

> stripped shellfish with a CCD camera, and on the basis of information on the intensity of fluorescent light emitted from the fetched image of shellfish, determining if there is residual shell on the stripped shellfish and subsequently removing any residual shell, wherein the shellfish is shrimp and crab and when a shellfish is shrimp the peak wavelength of irradiating light is 352 nm or less and when the shellfish is crab a peak wavelength is less than 400 nm." (Emphasis Added)

Therefore, withdrawal of the rejection of Claims 2, 3/1, 3/2, 4/1, 4/2, 6, 7/5, 7/6, 8/5 and 8/6 under 35 USC §103(a) as being unpatentable over Hayata et al. as applied to claims 1 and 5 above and further in view of Tessier et al. (U.S. Patent No. 5,902,177) is respectfully requested.

Conclusion

In view of the aforementioned amendments and accompanying remarks, claims 1-3 and 5-7, as amended, are in condition for allowance, which action, at an early date, is requested.

If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact Applicants undersigned attorney at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

Attached hereto is a marked-up version of the changes made to the claims by the current amendment. The attached page is captioned "**Version with markings to show changes made**."

In the event that this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 01-2340.

Respectfully submitted,

ARMSTRONG, WESTERMAN & HATTORI, LLP

George N. Stevens
Attorney for Applicant
Reg. No. 36,938

GNS/alw
Atty. Docket No. **020287**
Suite 1000, 1725 K Street, N.W.
Washington, D.C. 20006
(202) 659-2930

23850
PATENT TRADEMARK OFFICE

Enclosures: Version with markings to show changes made
Request for Approval of Drawing Corrections w/Fig. 4 marked in red ink
Substitute Abstract of the Disclosure

VERSION WITH MARKINGS TO SHOW CHANGES MADE 10/069,954

IN THE DRAWINGS:

Please amend Fig. 4 as indicated in the attached Request for Approval of Drawing Changes.

IN THE SPECIFICATION:

Page 2, first full paragraph, has been amended as indicated below:

In the case of most of shellfish, the shell thereof is discolored as it is heat-treated. Due to this discoloration of the shell, it can be relatively easily distinguished from the flesh portion thereof. Before heat-treatment, however, both the flesh portion and the shell thereof are whitish in most shellfish. Additionally, the residual shell that might be left on the flesh portion of shellfish is generally small in size. Therefore, it is difficult, before heat-treatment of shellfish, to visually distinguish the residual shell from the flesh portion even if a [peace] piece of residual shell is left in the flesh portion thereof, thus leaving the residual shell overlooked or unidentified occasionally. If a piece of shell is left intermingled in processed foods or retort foods, it would compromise the taste of consumers, and diminishing the commercial value thereof.

Page 3, second full paragraph, has been amended as indicated below:

With a view to solving the aforementioned problems, through extensive study and experiments conducted by the present inventors, it was finally found that when a light of a specific wave-range is irradiated onto shrimp or crab, a fluorescent light of a specific wave-range

is emitted not from the flesh portion thereof but from the shell thereof. Namely, the present invention has been accomplished as a result of intensive study on this fact and is characterized by [a] an irradiating light of a specific wave-range onto stripped shellfish after finishing the shell-stripping work thereof then, on the basis of information regarding the intensity of fluorescent light emitted from the shellfish, determining if there is any residual shell on the stripped shellfish, and subsequently removing any residual shell.

IN THE CLAIMS:

Please amend claims 1-3 and 5-7 as follows:

1. (Amended) A method of detecting and removing unstripped residual shell left on shellfish, [characterized by] comprising:

irradiating light of specific wave-range onto stripped shellfish after finishing a shell-stripping work [thereof] on the shellfish, and on the basis of information on the intensity of fluorescent light emitted from the shellfish, [determing] determining if there is residual shell on the stripped shellfish and subsequently removing any residual shell, wherein the shellfish is shrimp and crab and when the shellfish is shrimp a peak wavelength of irradiating light is 352 nm or less and when the shellfish is crab a peak wavelength is less than 400 nm.

2. (Amended) A method of detecting and removing unstripped residual shell left on shellfish, [characterized by] comprising:

irradiating light of specific wave-range onto stripped shellfish after finishing the shell-stripping work [thereof] on the shellfish,

taking an image of the stripped shellfish with a CCD camera, and on the basis of information on the intensity of fluorescent light emitted from the fetched image of shellfish, determining if there is residual shell on the stripped shellfish and subsequently removing any residual shell, wherein the shellfish is shrimp and crab and when a shellfish is shrimp the peak wavelength of irradiating light is 352 nm or less and when the shellfish is crab a peak wavelength is less than 400 nm.

3. (Amended) The method according to claim 1 or 2, wherein said shellfish is ["]shrimp["], and [said wave-range of] the peak wavelength of the irradiating light is [not more than 400nm, more preferably around 250nm] 254 nm.

5. (Amended) An apparatus for detecting and removing unstripped residual shell left on shellfish, said apparatus comprising;

a means for irradiating light of specific wave-range onto stripped shellfish after finishing the shell-stripping work [thereof] on the shellfish;

detection means for detecting a fluorescent light emitted from said shellfish;

a means for determining if there is left a residual shell of the shellfish on the stripped shellfish on the basis of information obtained from said detection means; and

means for removing any residual shell on the basis of information from said determining means, wherein the shellfish is shrimp and crab and when the shellfish is shrimp a peak wavelength

of irradiating light is 352 nm or less and when the shellfish is crab a peak wavelength is less than 400 nm.

6. (Amended) An apparatus for detecting and removing unstripped residual shell left on shellfish, said apparatus comprising;

a means for irradiating a light of specific wave-range onto stripped shellfish after finishing the shell-stripping work [thereof] on the shellfish;

a CCD camera disposed to face said stripped shellfish; a means for determining if there is residual shell on the stripped shellfish on the basis of information on the intensity of fluorescent light that can be obtained from the image taken by said CCD camera; and

means for removing any residual shell on the basis of information from said determining means, wherein the shellfish is shrimp and crab and when the shellfish is shrimp a peak wavelength of irradiating light is 352 nm or less and when the shellfish is crab a peak wavelength is less than 400 nm.

7. (Amended) The apparatus according to claim 5 or 6, wherein said shellfish is ["]shrimp["], and [said] the [wave-range of the] peak wavelength of the irradiating light is [not more than 400nm, more preferably around 250nm] 254 nm.